APPENDIX C

ORGANIC CARBON CONCENTRATION AND LOAD GRAPHS

BENCHMARK LOCATIONS

Figure C-1 — Banks Pumping Plant concentrations: 1/90 - 8/93

Notes: Concentrations range from about 3 to over 10 mg/l. Wet season concentrations are higher than dry season concentrations and wet year/wet season concentrations are higher than dry year/wet season concentrations. Concentrations and the pattern are more similar to that seen at Vernalis (Figure B- 9) then at Greene's Landing (Figure B-2).

Figures C-2 and C-3 — Sacramento River at Greene's Landing concentration monthly grab data and load: 7/90 - 9/93

Notes: Concentrations generally are around 2 mg/l. Exceptions occurred during the wet season months and during late summer 1993

Figures C-4 and C-5 — Sacramento River at Greene's Landing concentration daily autosampler data and load: 1/93 - 9/93

Notes: The autosampler data showed that, for the same period of record (1993), daily concentrations during the dry season are relatively the same as the monthly concentrations during the dry season. However peak wet season concentrations, during January and February 1993 (up to almost 7 mg/l) were not reflected in the monthly data. DWR MWQI field sampling crews are unable to sample during peak runoff storm periods for safety reasons and because of poor levee road conditions. It is likely the monthly data underestimates the range of concentrations in the wet months.

Figure C-6 — Specific absorbance at Greene's Landing: 7/90 - 9/93

Notes: Humic substances in water when chlorinated lead to the formation of trihalomethanes. Most humic substances strongly absorb ultraviolet light at the 254 nm wavelength. This physical characteristic is useful in assessing the THM precursor potential of DOC in water supplies. To assess the relative amount of precursor or humic material in water, the UV-254 nm absorbance is compared to the DOC concentration of a water sample. This ratio is called the specific absorbance.

In general, the specific absorbances of agricultural drainage from organic soils in the Delta are 0.03 and higher. When the specific absorbance of river water samples approach 0.03, it is usually an indication of increasing amounts of surface water runoff and/or drainage water in the channels. At other times, the specific absorbances in the Delta channels are about 0.02.

The specific absorbance is relatively constant throughout the year at 0.02.

Figures C-7 and C-8 DOC mass versus Sacramento River at Freeport flow for an entire year and the dry season (1993)

Notes: During 1993, there was a good correlation between flow and load of DOC in the Sacramento River when flows were below about 50,000 cfs. There were some times of anomolously high DOC load during the wet season when flows were greater than about 50,000 cfs. This corresponded to the period during which the specific absorbance was greater than 0.03.

Figures C-9 and C-10 San Joaquin River at Vernalis concentration monthly grab data and load: 7/90 - 9/93

Notes: Concentrations generally exceeded 2 mg/l and were in the range of 2 to 4 mg/l. These concentrations are greater than at Greene's Landing. It may be that the recirculation of water in the Delta-Mendota Canal--lower San Joaquin River loop concentrated organic carbon. Peak concentrations occurred during wet season months (in the range of 4 to almost 12 mg/l).

Figure C-11 Specific absorbance at the San Joaquin River at Vernalis: 7/90 - 9/93

Notes: Specific absorbance greater than 0.03 occurred only during January 1993, a wet year.

SACRAMENTO BASIN AGRICULTURAL DISCHARGE

Figure C-12 Natomas East Main Drainage Canal concentration: 10/89 - 9/92

Notes: Concentrations ranged from about 3 to 10 mg/l. Peak concentrations occurred at various times of year. Concentrations at NEMD Canal did not correlate at all with rainfall.

Figure C-13 Sacramento Slough load: 10/89 - 9/92

Notes: Loads were generally less than 10,000 lbs/day. Peak loads were as high as 40,000 lbs/day. Peak loading occurred at various times of year. There was not a good correlation between flow and loads.

Figure C-14 Colusa Basin Drain load: 10/89 - 8/93

Notes: There was a great deal more variability in loads in Colusa Basin Drain than in Sacramento Slough (reflecting more variable flow). There was not a good correlation between flow and loads.

SACRAMENTO REGIONAL WASTEWATER TREATMENT PLANT EFFLUENT

Figures C-15 and C-16 SRWTP effluent concentration and load: 9/91 - 8/93

Notes: Concentrations were generally between about 12 and 18 mg/l. Concentration was relatively constant with one peak concentration of over 40 m/l in March 1992. With a constant concentration, there was a very good correlation between load and flow.

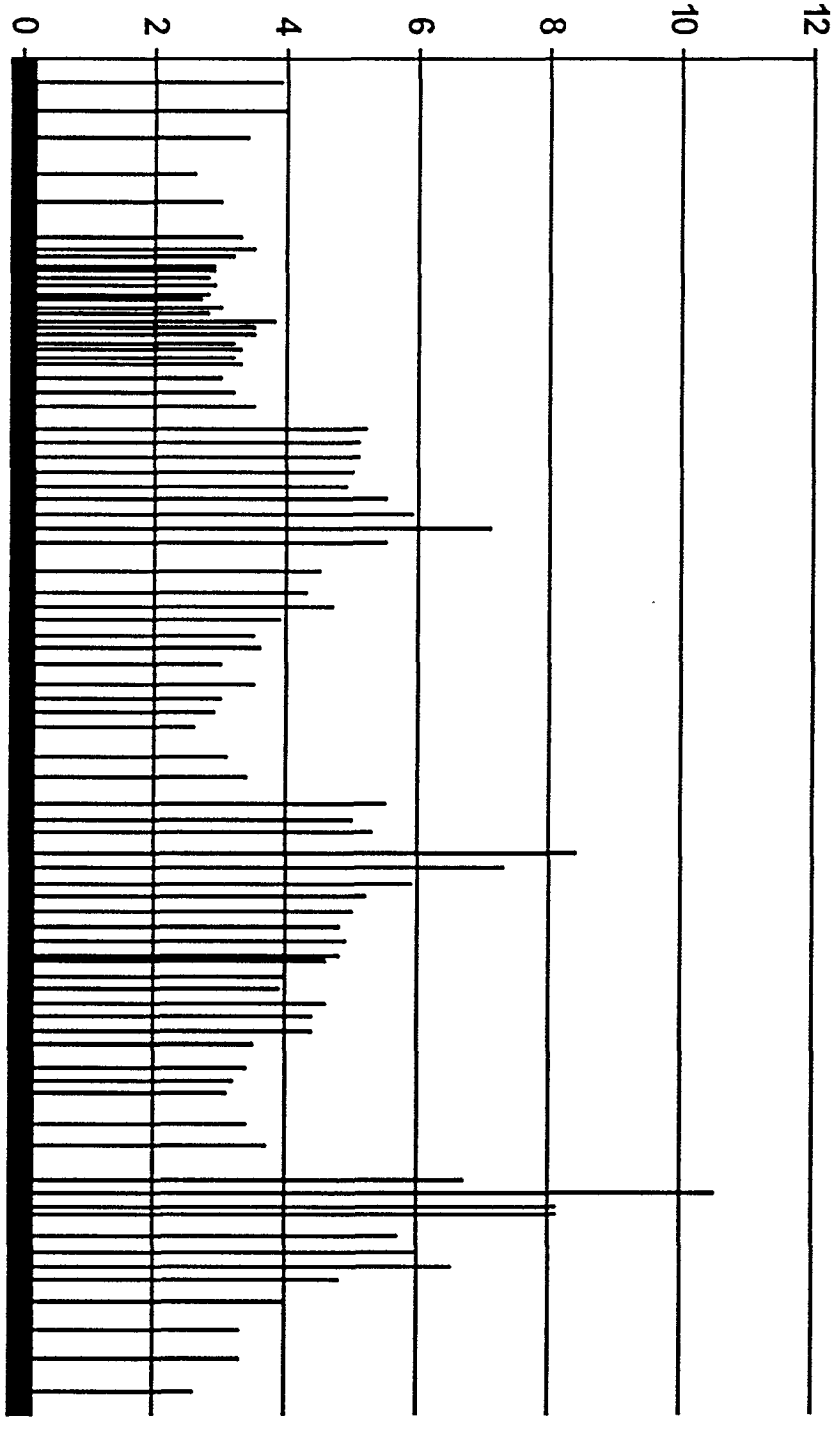

Figure C-1. Banks Pumping Plant DOC Concentration, 1990–1993 (mg/l)

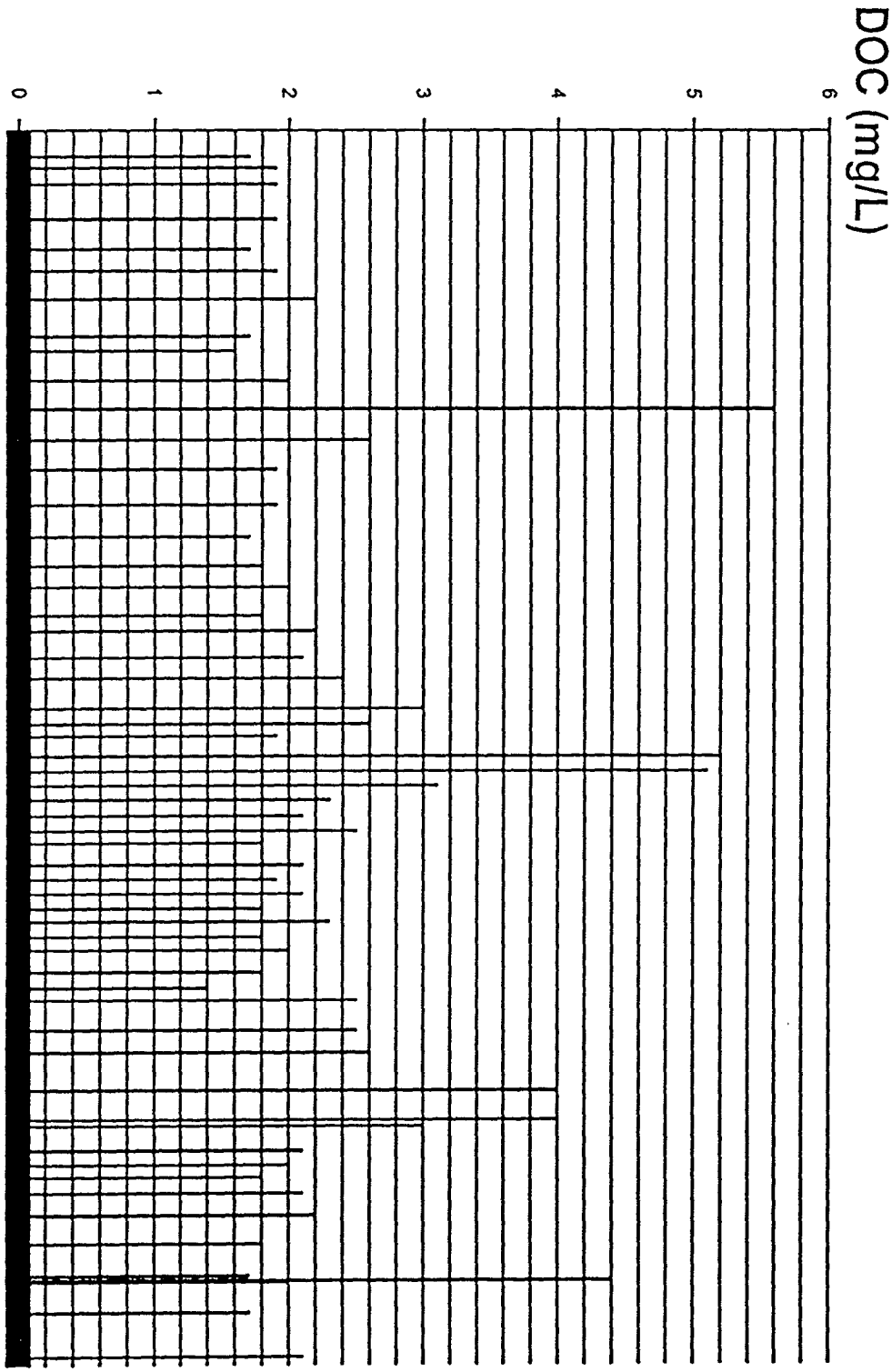

Figure C-2. Greenes Landing DOC Concentration, 1990--1993 (mg/l)

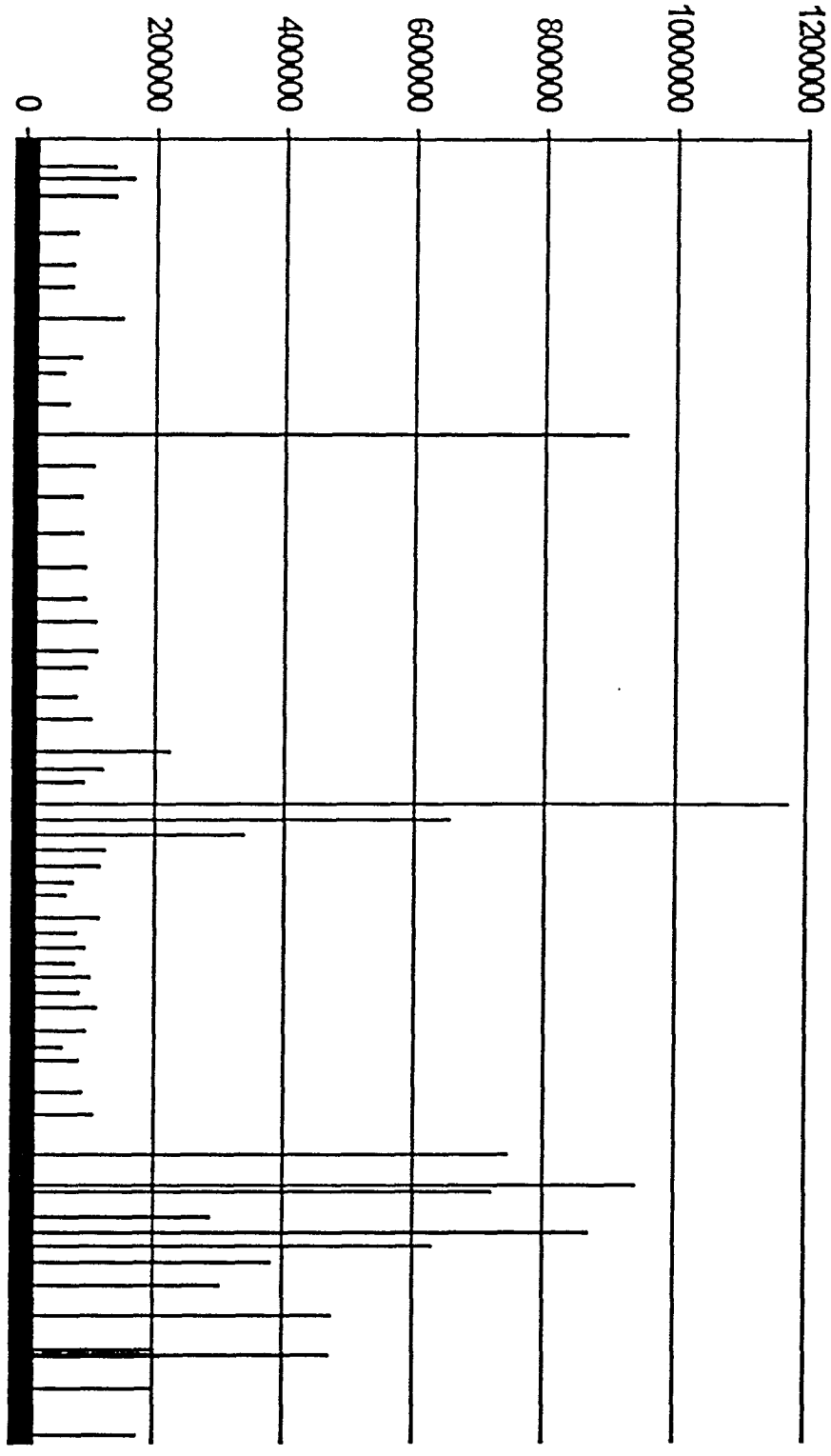

Figure C-3. Greenes Landing DOC Mass Loads, 1990–1993 (lbs/day)

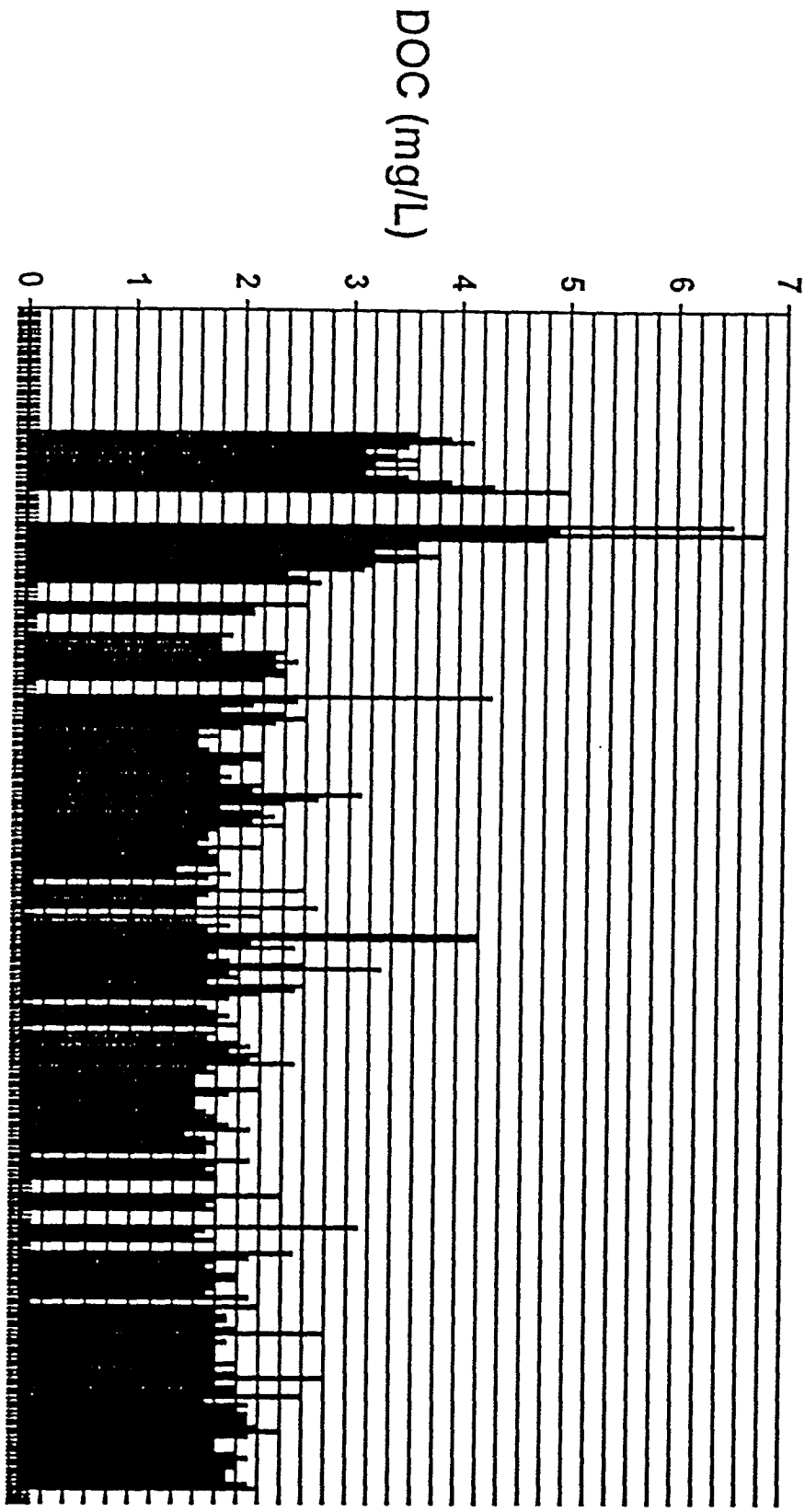

Figure C–4. Autosampler Greenes Landing DOC Concentration, 1993 (mg/l)

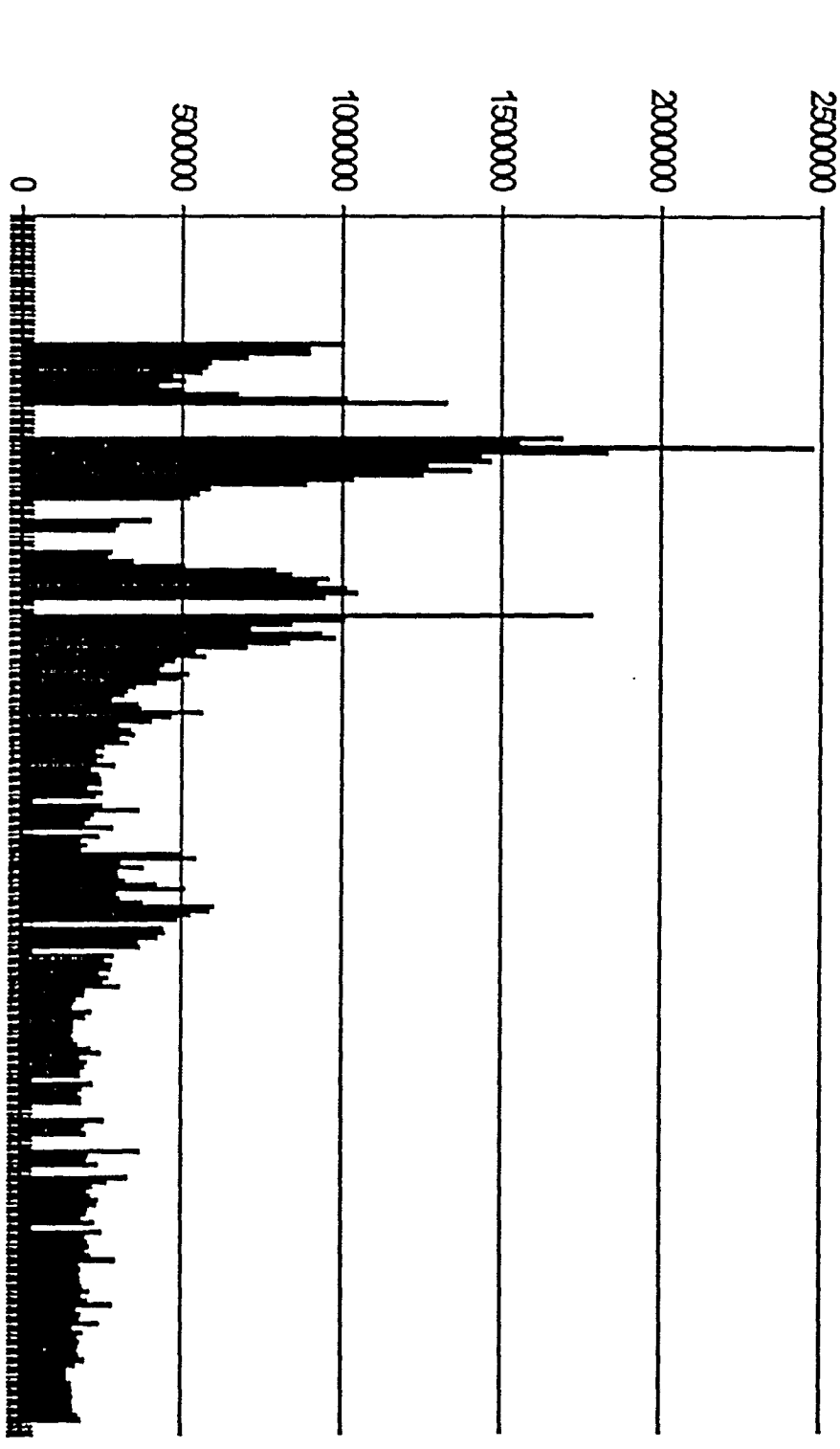

Figure C-5 Autosampler Greenes Landing DOC Mass loads, 1993 (lbs/day)

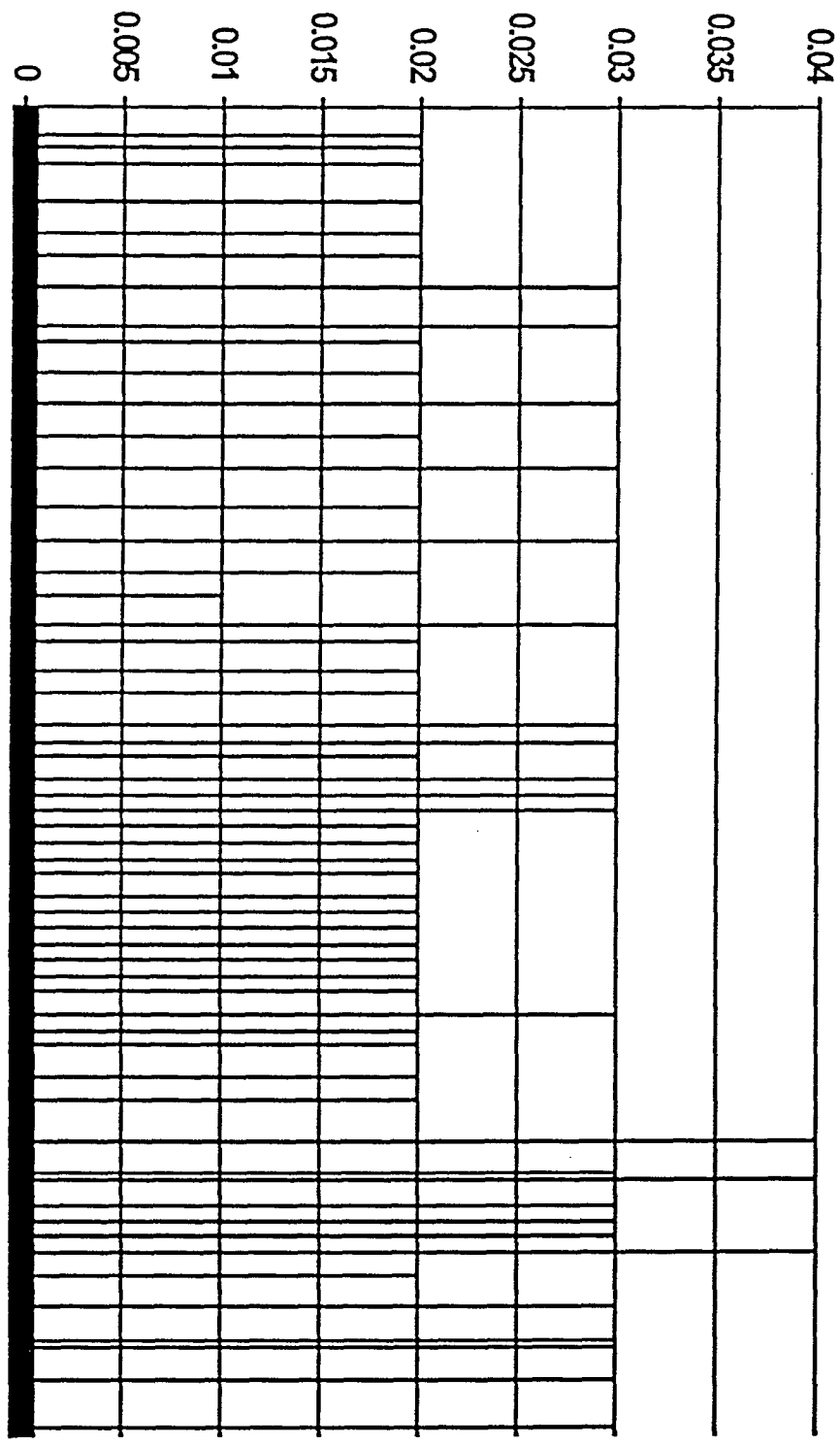

Figure C-6. Specific Absorbance at Greenes Landing, 1990-1993

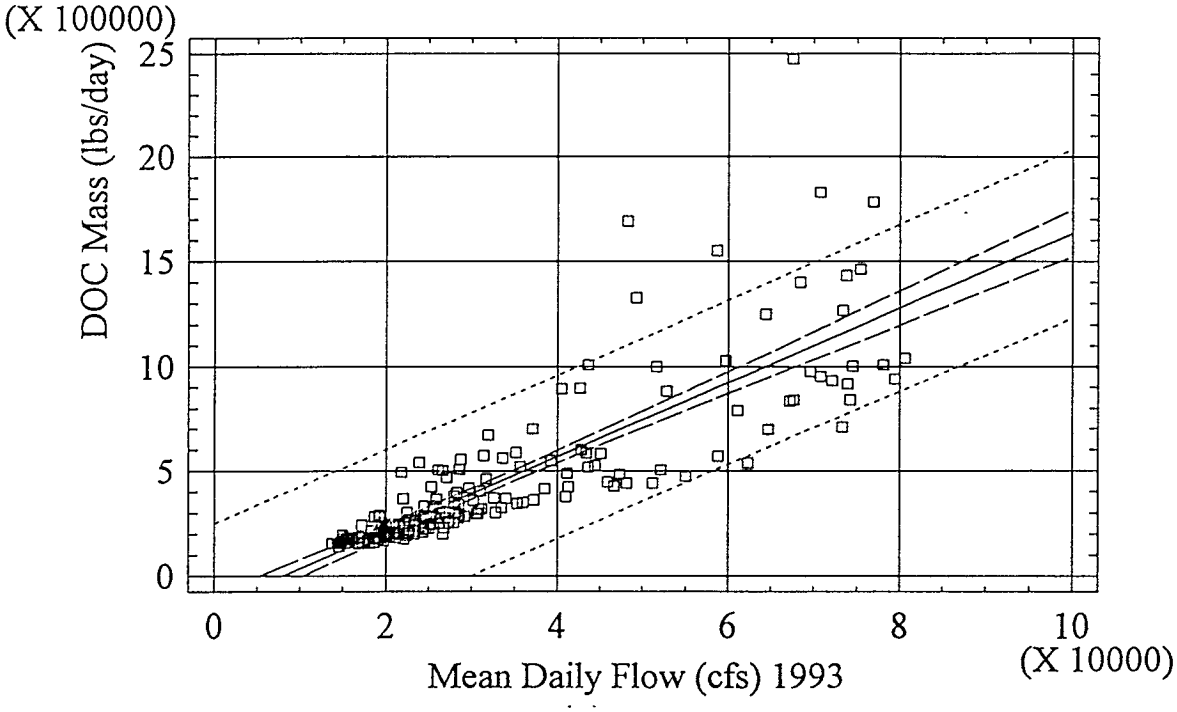

Figure C-7. DOC Mass vs. Sacramento River Freeport Flow

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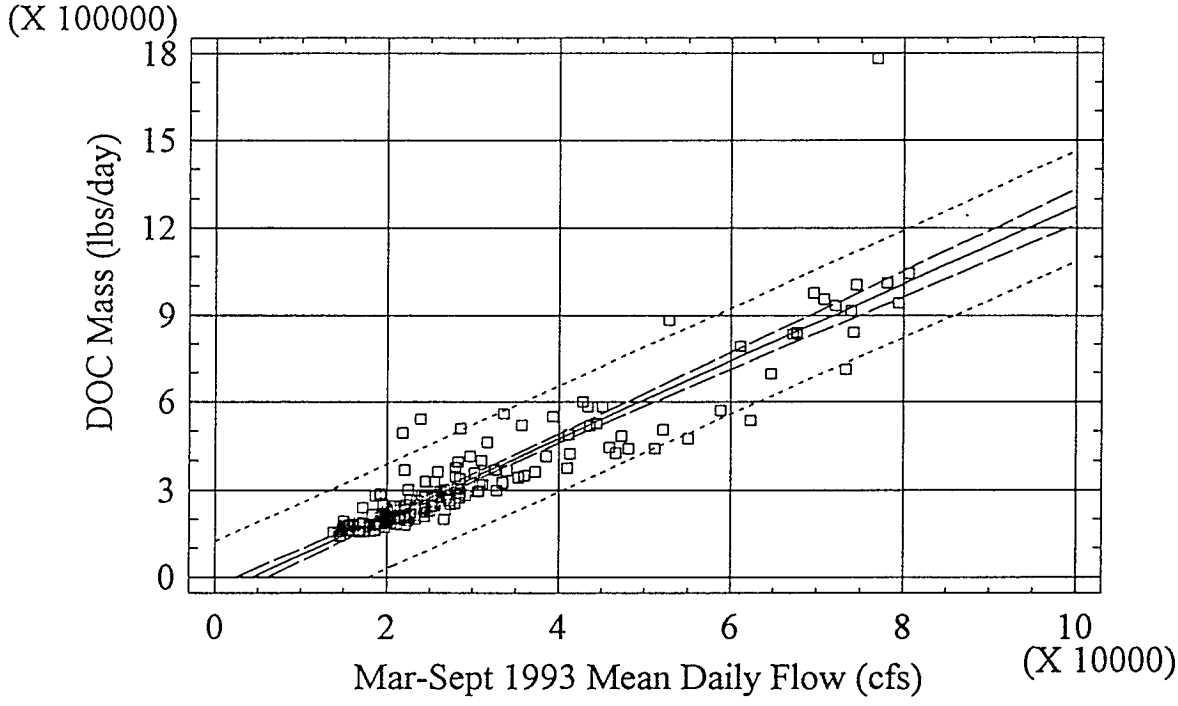

Figure C-8. DOC Mass vs. Sacramento River Freeport Flow

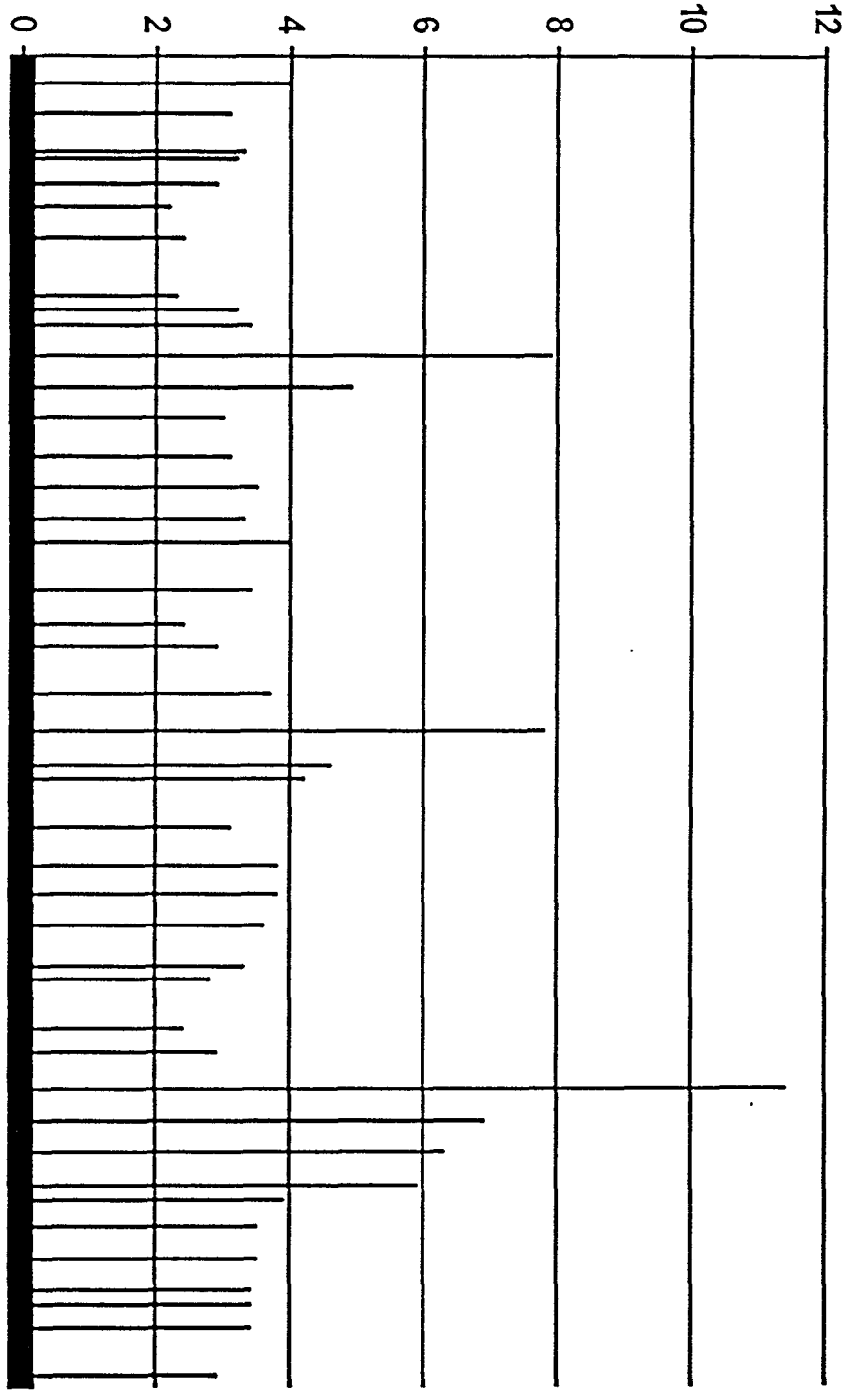

Figure C-9. Vernalis DOC Concentrations, 1990--1993 (mg/l)

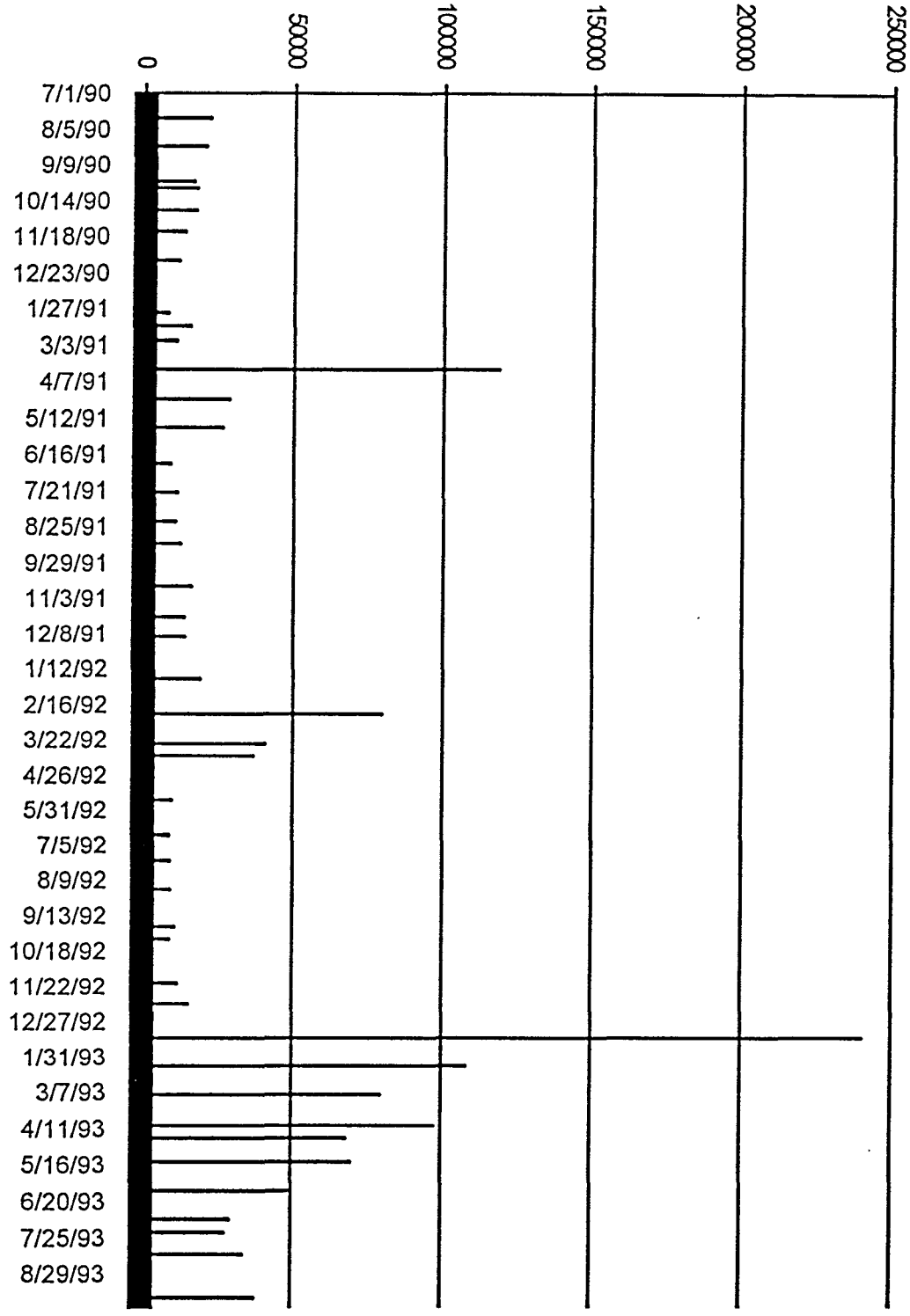

Figure C-10. Vernalis DOC Mass Loads, 1990-1993 (lbs/day)

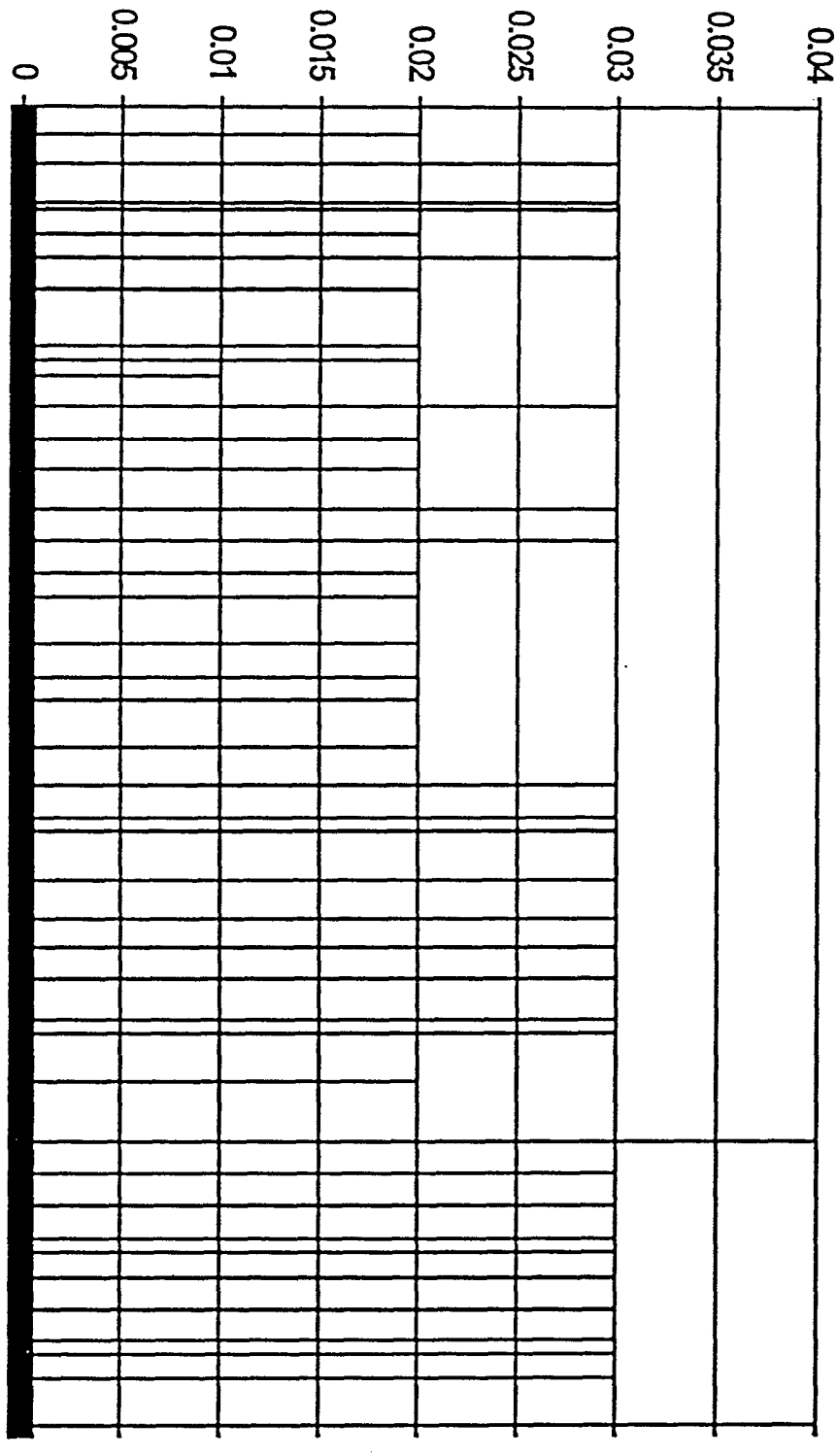

Figure C-11. Specific Absorbance at Vernalis, 1990–1993

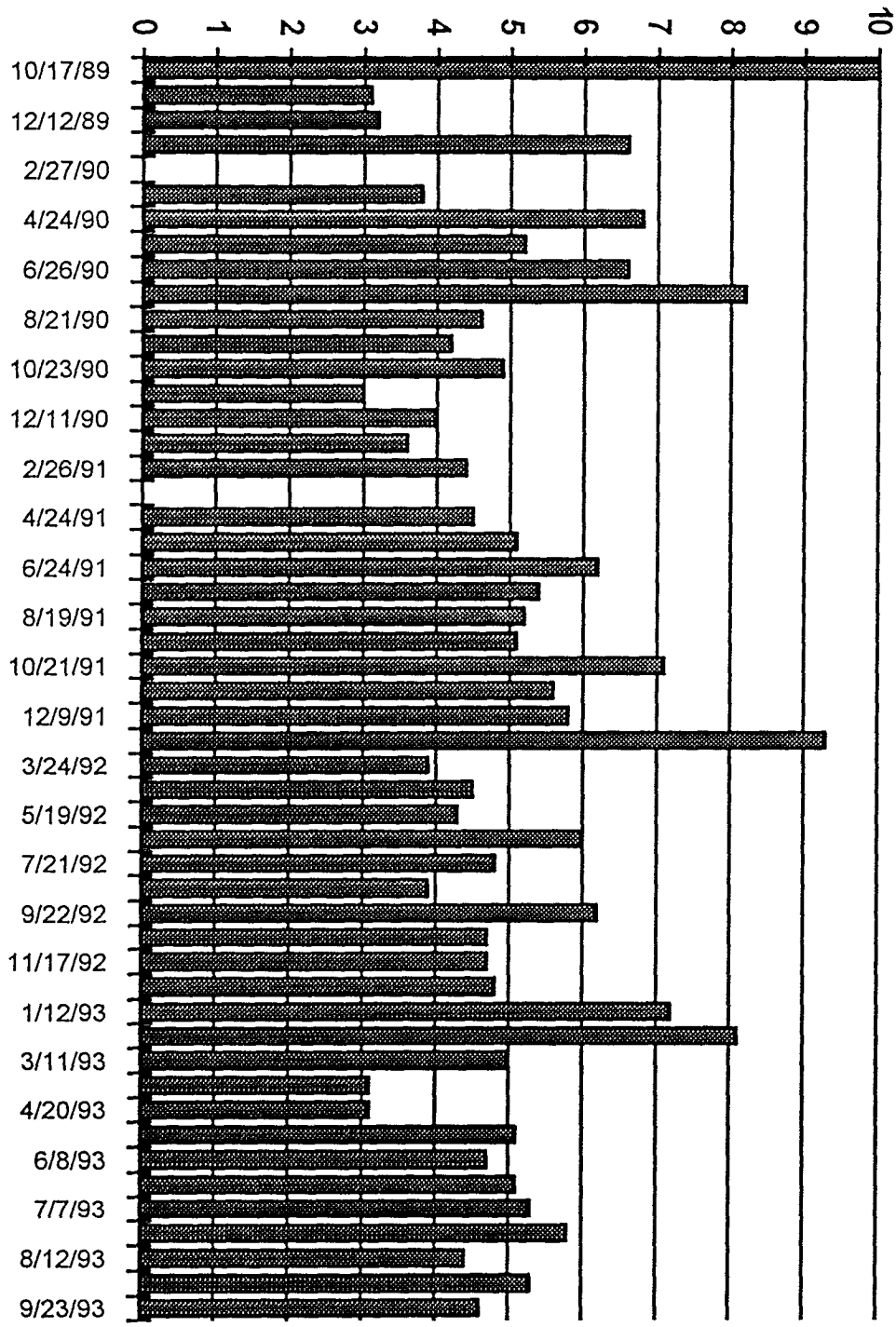

Figure C-12. Natomas East Main Drain DOC Concentration, 1989-1993 (mg/l)

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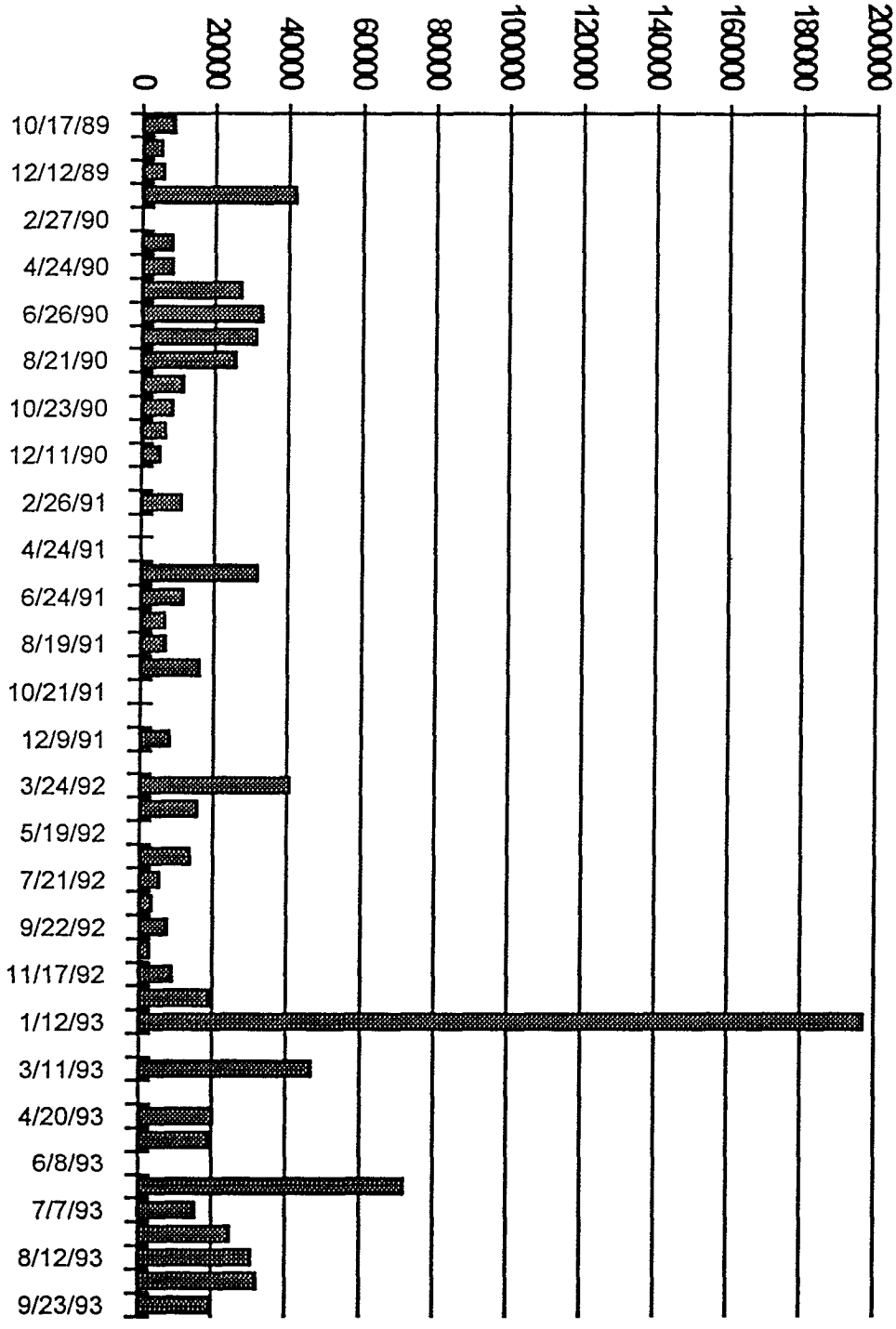

Figure C-13. Sacramento Slough DOC Mass Load, 1989-1993 (lbs/day)

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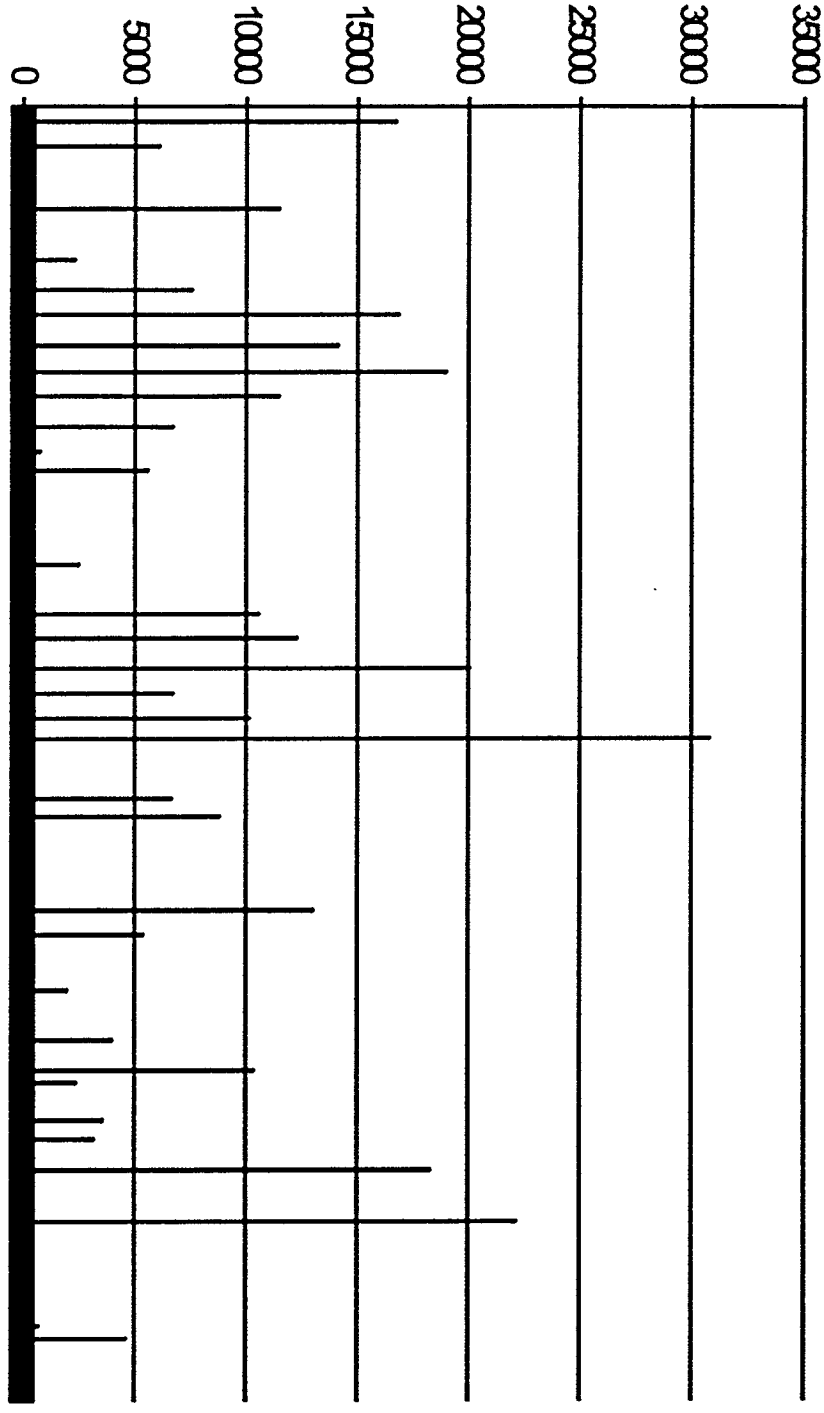

Figure C-14. Colusa Basin Drain DOC Mass Loads, 1989-1993 (lbs/day)

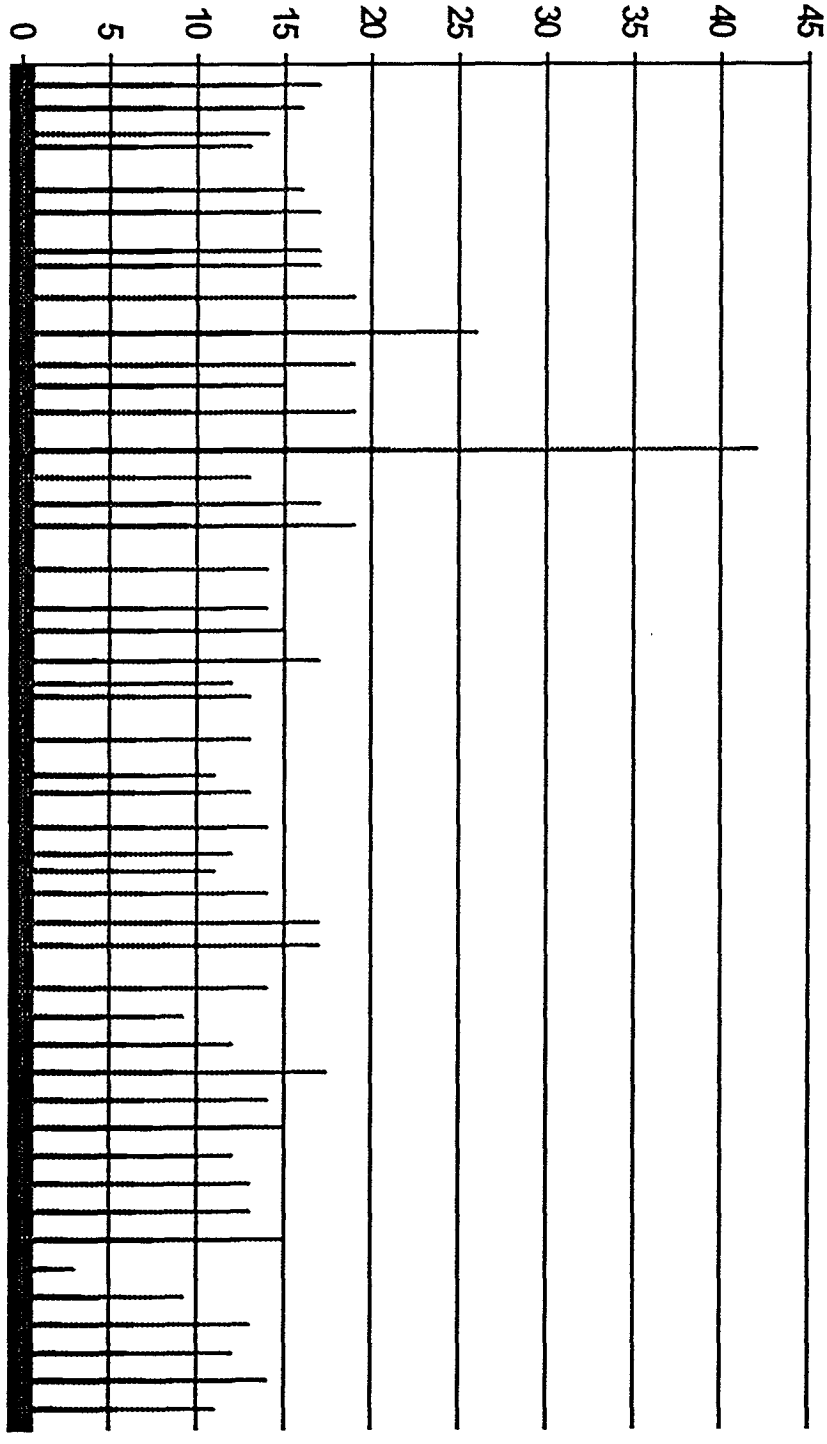

Figure C-15. Sacramento Regional Wastewater Effluent DOC Concentrations, 1991–1993 (mg/l)

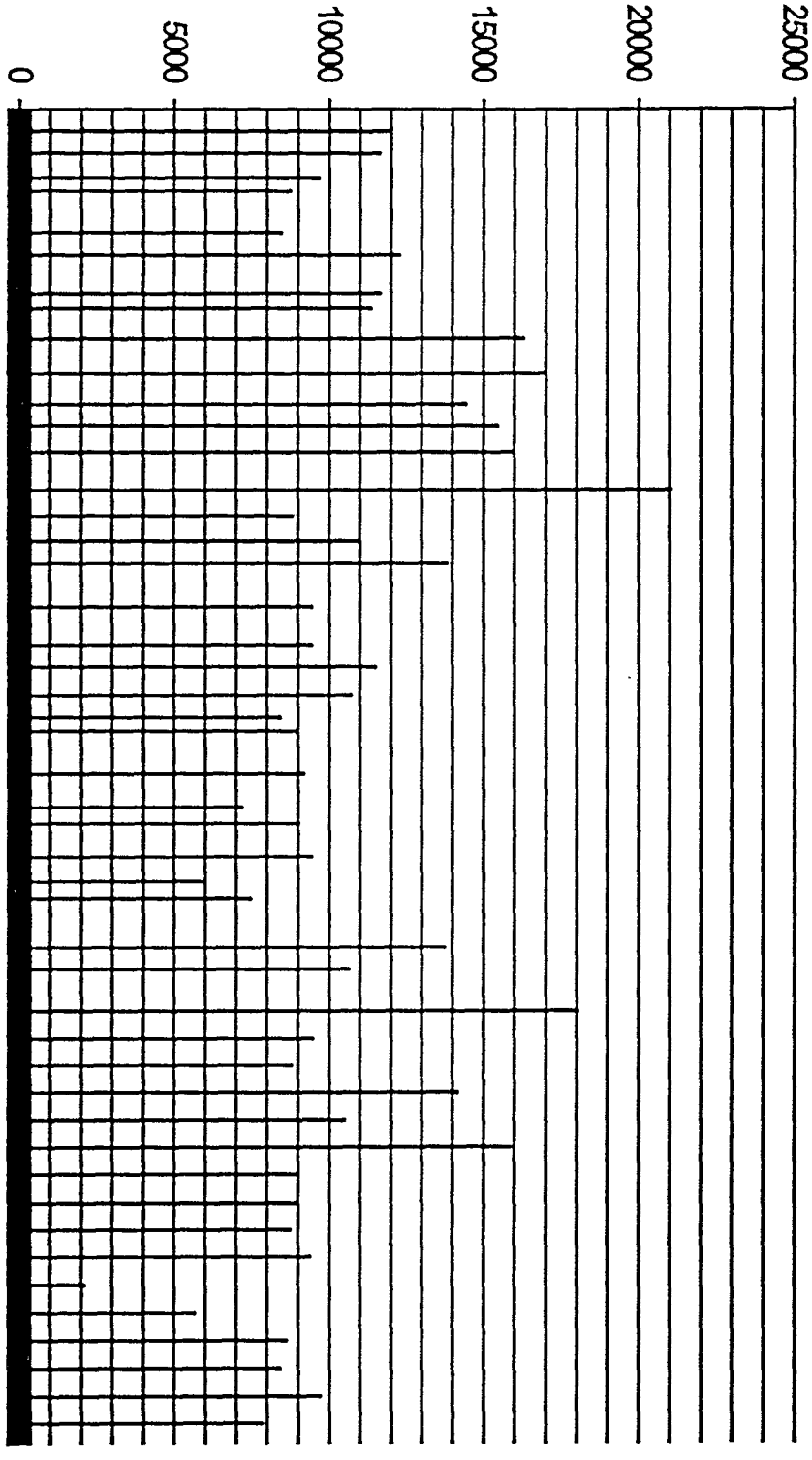

Figure C-16. Sacramento Regional Wastewater Effluent DOC Load, 1991–1993 (lbs/day)